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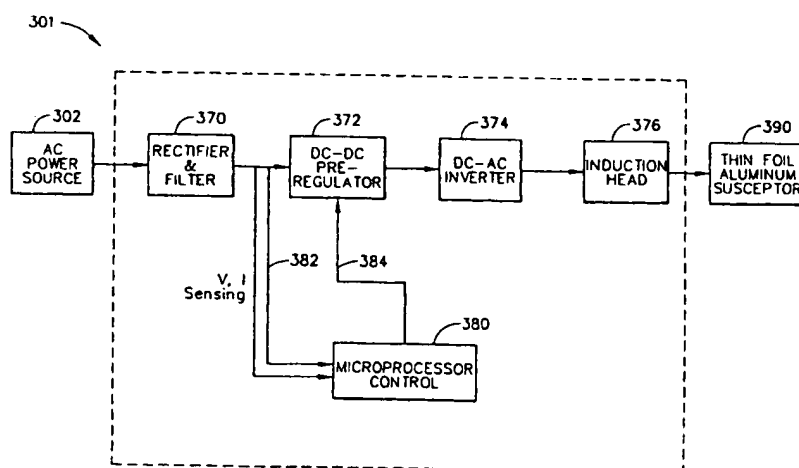
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[Continued on next page]

(54) Title: HAND HELD INDUCTION TOOL



(57) Abstract: An apparatus and system for using magnetic fields to heat magnetically susceptible materials within and/or adjacent to adhesives, resins, or composites so as to reversibly or irreversibly bond, bind, or fasten opaque or non-opaque solid materials to one another. The system makes use of the effect that alternating magnetic fields induce eddy currents and generate heat within susceptors, and the effect that alternating magnetic fields additionally induce magnetic hysteresis that occurs in magnetic materials and thereby generate heat. An induction heating tool is used to emit the magnetic field at its work coil, and an electronic controller measures the energy being used by a power converter that generates the alternating current driving the work coil which creates the magnetic field. The distance between the susceptor and work coil is repeatedly analyzed based upon the power converter's input energy, and the work coil is driven at a repeatedly corrected power level during the heating cycle. Once a sufficient accumulated energy has been delivered to the susceptor, the magnetic field is turned off automatically by the tool, thus preventing overheating of the susceptor.



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— *with international search report*

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13 December 2001

INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 467 165 A (KIUCHI) 21 August 1984 (1984-08-21) ---	
A	GB 2 325 982 A (VALRO) 9 December 1998 (1998-12-09) ---	
A	US 5 286 941 A (BEL CLAUDE) 15 February 1994 (1994-02-15) ---	
A	US 4 897 518 A (MUCHA) 30 January 1990 (1990-01-30) ---	
A	US 4 177 494 A (TELLERT) 4 December 1979 (1979-12-04) ---	
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search

17 July 2001

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/30517

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 953 783 A (PETERS) 27 April 1976 (1976-04-27) column 2, line 63 -column 3, line 11; claims 1,4 ---	11,12
A	US 4 277 667 A (KIUCHI) 7 July 1981 (1981-07-07) column 54, line 27 - line 60 ---	11,12
A	US 5 134 261 A (LARKIN JOHN J ET AL) 28 July 1992 (1992-07-28) the whole document ---	14
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A	US 4 234 824 A (DEN HOLLANDER WILLEM) 18 November 1980 (1980-11-18) the whole document ---	18
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A	US 5 723 849 A (HEALY JAMES ET AL) 3 March 1998 (1998-03-03) the whole document -----	20

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/30517

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10:
2. Claims: 11-13:
3. Claims: 14-15:
4. Claims: 16,17:
5. Claims: 18,19:
6. Claims: 20-22:

INTERNATIONAL SEARCH REPORT

Information on patent family members

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